

REMARKS

Reconsideration of the above-identified application in view of the amendments above and the remarks following is respectfully requested.

Claims 1-10 are in this case. Claims 1-10 have been rejected. Claims 1, 5-7, and 9 are now amended. Claims 11-19 are now added.

35 U.S.C. § 103(a) Rejections – Kari et al in view of Kirby and Lesley

The Examiner has rejected claims 1-3, 5, and 7-10 under 35 USC § 103(a) as being unpatentable over Kari et al. (6,389,008) in view of Kirby (6,047,179) and Lesley (6,188,752). Claims 1, 5, 7, and 10 have now been amended.

The present invention establishes a mobile communication system which enables prepaid subscribers of a home mobile network to roam within a visited mobile network. The basic infrastructure consists of a home and a visited mobile network, both of which contain an integrated intelligent gateway. The home and visited mobile networks are connected by a global packet switch network between the two intelligent gateways, in addition to the standard voice and data connections. In the present invention, the home intelligent gateway handles queries from the visited network regarding prepaid users, as needed to obtain the required information and authorization from the billing system and that these calls or other telephony services do not exceed the duration to which the user is entitled. The home intelligent network is able to handle queries regarding roaming prepaid users due to the special home network configuration taught by the present invention.

By contrast, mobile telephony networks known in the art do not support roaming for prepaid subscribers because they are not configured to respond as needed to support roaming prepaid users. When a roaming subscriber connects to a visited mobile network, the visited network queries the home network to acknowledge that the roaming user is a subscriber to the home network, and to receive authorization to provide the user with roaming telephony services. At present, mobile networks are not set up to provide this authorization for their subscribers roaming in a different network. When the

home network identifies that a query has been received from a different network regarding a prepaid subscriber, the home network simply refuses to authorize the visited network to provide services to the roaming prepaid user, without any consideration of the user's current balance.

The Examiner states that Kari discloses all the claimed subject matter except for debit system services which is taught in Kirby, and prepay communication services which is taught in Lesley. The Examiner states that Kari discloses the General Packet Radio Service (GPRS) environment of a roaming mobile network having an inherent home mobile network and visiting an inherent visited mobile network, in which the home intelligent gateway and visited intelligent gateway communicate via GPRS. Kari thus discloses a system having a similar infrastructure to the infrastructure of the present invention. It is noted however, that the Intelligent gateways do not in fact communicate via GPRS.

To distinguish the present invention from prior art, and to expedite prosecution in this case, Applicants have amended claim 1 to explicitly state that the home network is configured to direct call management messages for calls associated with roaming prepaid subscribers to the home intelligent gateway. The home intelligent gateway assumes the role of a home network base station for all calls associated with roaming prepaid users. This configuration bypasses the mechanism in the mobile network which automatically rejects calls involving roaming prepaid users. After a call is placed, the home and visited intelligent gateways communicate between themselves to ensure that the visited network does not provide the subscriber with services which exceed his prepaid balance at the home network, specifically that the visited network does not allow the call to exceed the allowed duration.

In the present invention, a registration process is enabled by the home mobile network when a roaming prepaid subscriber connects to a visited mobile network. During the registration process, the home intelligent gateway registers the roamer as it is a local VLR in the home network. The prepaid

system then can handles the roaming prepaid user like a local prepaid user. Communications are also established between the intelligent gateways in the home and visited networks, so that information necessary to control call duration for the roaming user is communicated between the networks. When a roaming prepaid user places a call at the visited network, the visited network requests authorization from the home network. As a result of the special configuration provided in the present invention, the home intelligent gateway receives the query, and control of the call passes to the home and visited intelligent gateways, which together ensure that the call does not exceed the maximum duration the prepaid user is entitled to. Applicant respectfully submits that the above amendment overcomes the rejection of claim 1 by Kari's teachings in view of Kirby and Lesley, for the reasons that follow.

Kari teaches a system in which a billing gateway GPRS node (BGGSN) is connected to the intra-network GPRS backbone network. The BGGSN collects billing information from other gateway GPRS nodes (GGSNs) connected to the backbone network, including nodes connected to external networks over an inter-operator GPRS network. The BGGSN receives user-specific billing information for roaming users, and forwards the charging information to the home network charging system.

Kari does not teach configuring the home network to transfer call management messages regarding a prepaid user received from an external network to the BGGSN. The home network handles call authorization for a roaming prepaid user in the customary manner. In the known art, this handling results in the home network refusing to authorize the visiting network to provide telephony services to the roaming prepaid user. Since no calls are authorized, no billing information is generated. No other information is provided by the home network BGGSN to the visited network BGGSN regarding the prepaid user. The presence of the BGGSNs within the mobile networks does not render it possible for the visited network to control a roaming user's call.

The BGGSN in Kari is not parallel to the intelligent gateway of the present invention. In the present invention, the intelligent gateway simulates the function of a local base station, for all aspects of the call related to billing and call authorization. By contrast, the BGGSN merely gathers information as a database, by exchanging billing information with a BGGSN in the visited network. Kari does not teach how the information gathered by the BGGSN can be used to control a call to or from a roaming prepaid user. In particular, no mention is made of controlling call duration from the BGGSN.

Neither Kirby nor Lesley overcome the basic problem in Kari, which is that calls related to a roaming prepaid user are rejected by the home network solely on the basis that the user is a prepaid user. The Examiner states that Kirby provides a system in which debit information is communicated between wireless networks. The home network can thus provide the debit platform of the visited network with authorization information for a roaming user. Kirby does not overcome the problem that the home network rejects prepaid user calls a priori. Kirby's teaching simply provides a pathway for the home network to communicate the rejection to the visited network.

The Examiner states that Lesley presents a prepay communication service for a subscriber, in which call connections may be set up through other nodes, exchanges, and networks. Lesley provides telephony services to local users subscribing to a prepaid billing service on the basis of a balance stored in a database, not on a prepaid calling card. Lesley describes how subscriber calls are managed within the network in accordance with the subscriber's balance. Lesley does not teach special handling for roaming prepaid users to ensure that they are able to place calls from the visited network, nor for providing the visited network with an allowed call duration which can be used to control the call.

In summary, while Kari, Kirby, and Lesley address issues relating to handling of prepaid users within the home network, and of transmitting billing information between a home and a visited mobile network, no solution is provided to the essential problem that users are prevented from placing calls

from a visited network on the sole basis that they are prepaid subscribers. Configuring the home network to pass call management messages for roaming prepaid users directly to the home intelligent gateway ensures that the decision whether or not to allow the call is made on the basis of the user's balance. The intelligent gateways then actively control calls to and from the roaming prepaid user, through the exchange of control information over the packet-switched network.

As such, it is Applicant's strong opinion that Kari et al. in view of Kirby and Lesley does not render obvious the present invention as claimed. Applicant respectfully submits that independent claim 1 is now allowable as amended.

Applicant believes that independent claims 5, 7, and 9 are amended in a similar manner as claim 1, and are allowable as now amended. Applicant further submits that claim 2 is dependent upon claim 1, claim 3 is indirectly dependent upon claim 1, claim 8 is dependent on claim 7, and claim 10 is dependent on claim 9, which claims are believed to be allowable as now amended.

35 U.S.C. § 103(a) Rejections – Kari et al.

The Examiner has rejected claim 6 under 35 USC § 103(a) as being unpatentable over Kari et al. (6,389,008). Claim 6 has now been amended.

The Examiner states that Kari discloses a method for inherently registering a user at the visited mobile network if the visited network has an integrated intelligent gateway connected by a packet-switch network to a home intelligent gateway, and if the inter-operator backbone network supports GPRS roaming. The Examiner states that refusing to register the user if an intelligent gateway is not present to facilitate inter-operator communication would be obvious to one skilled in the art.

To distinguish the present invention from prior art, and to expedite prosecution in this case, Applicants have amended claim 6 to include the parallel features to the amendment of claim 1.

Applicant wishes to reiterate the arguments brought hereinabove for claim 1. Kari does not provide for configuring the home network in such a way to ensure that roaming services are permitted for prepaid users. As such, Kari's method does not provide the essential ability of controlling call duration for a roaming prepaid user on the basis of the user's current balance.

The Examiner states that registration under Kari is inherent for roaming subscribers, since in the basic structure of GSM networks requires registration of roaming users in the visited network. Registering a roaming user in the visited network is primarily for routing purposes, that is, for updating the home location registry (HLR) and visitor location registry (VLR). Note that in the present invention, user registration establishes proper call management messaging within the home network, in addition to the standard function of updating the user location. In the present invention the home intelligent gateway is actively involved in providing the visited network with the necessary authorization to permit the roaming prepaid user to place or receive a call. The registration process also establishes information flow between the home and visited intelligent gateways regarding the user over the data connection.

As such, it is Applicant's strong opinion that Kari et al. does not render obvious the present invention as claimed. Applicant respectfully submits that independent claim 6 is allowable as now amended.

35 U.S.C. § 103(a) Rejections – Kirby in view of Kari et al.

The Examiner has rejected claims 7 and 9 under 35 USC § 103(a) as being unpatentable over Kirby in view of Kari et al. Claims 7 and 9 have now been amended.

The Examiner states that Kirby discloses the method of enabling telephony services to a user roaming in a visited mobile, for a user having a prepaid account in the home network. Kari discloses placing mobile calls for a

roaming user if the visited network has an integrated intelligent gateway connected to a global packet-switch network.

Applicants have amended claim 7 has been amended to recite:

7. A method for enabling telephony services when roaming in a visited mobile network to a user subscribing to a home mobile network and having a prepaid account with a balance at said home mobile network, the method comprising the steps of:

registering said user in said visited mobile network; and

placing mobile originated calls from said visited mobile network if a home intelligent gateway integrated into said home mobile network communicates call management information for controlling a duration of said call via a global packet switch network to a visited intelligent gateway integrated into said visited mobile network, wherein said call management information is directed to said home intelligent gateway by said home mobile network.

Applicants have amended claim 9 in a similar manner to recite:

9. A method for enabling telephony services when roaming in a visited mobile network to a user subscribing to a home mobile network and having a prepaid account with a balance at said home mobile network, the method comprising the steps of:

registering said user in said visited mobile network; and

placing mobile terminated calls to said visited mobile network if said visited mobile network has a visited intelligent gateway integrated therein that communicates call management information to a home intelligent gateway integrated into said home mobile network via a global packet switch network, so as to control a duration of said call, wherein said home mobile network is configured to direct call management messages for calls associated with roaming prepaid subscribers to said home intelligent gateway.

Applicants assert that the present invention is distinguished from Kirby in that the home network is configured to direct call management messages to the home intelligent gateway. By establishing the flow of call management messages to the intelligent gateway, the present invention ensures that mobile originated calls can be placed by the visited mobile network (claim 7), and that mobile terminated calls can be placed by the home mobile network (claim 9). As discussed above, Kari does not discuss configuration and call management for roaming prepaid users, only collection of billing information from an external mobile network.

As discussed for claim 1 above, neither Kirby nor Kari teach a mobile network configuration which allows calls to be placed for roaming prepaid users. As such, it is Applicant's strong opinion that Kirby in view of Kari et al. does not render obvious the present invention as claimed. Applicant respectfully submits that independent claims 7 and 9 are allowable as now amended.

35 U.S.C. § 103(a) Rejections – Kirby and Kari et al. in view of Dahm

The Examiner has rejected claims 8 and 10 under 35 USC § 103(a) as being unpatentable over the combination of Kirby and Kari, in view of Dahm (6,466,783). Claims 8 and 10 have now been amended.

The Examiner states that the combination of Kirby and Kari disclose the method of claims 7 and 9 respectively, but do not explicitly disclose the steps of enabling the roaming prepaid user to recharge his balance and to continue the call if the balance is sufficiently recharged. Dahm suggests a visual interface for mobile subscribers for recharging prepaid services.

Applicant respectfully submits that claim 8 is dependent upon claim 7, and claim 10 is dependent on claim 9, which include the feature of configuring a home mobile network to permit controlling call duration for prepaid users roaming in a visited mobile network. Dahm addresses only the issue of recharging the user balance, but not the vital issue of call control. As such, it is

Applicant's opinion that Kirby and Kari et al. in view of Dahm does not render obvious the present invention as claimed.

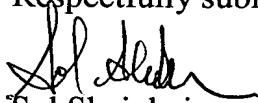
Claims 17-19 are added to the application. Claim 17 is directed at a mobile telephony system in which the address of the home intelligent gateway is provided to the visited mobile network when registering a roaming prepaid user. The visited intelligent gateway thus establishes communication directly with the home intelligent gateway when a mobile originated or terminated call is being placed for the roaming user. Claim 17 is supported in the description of the preferred embodiment of scenario (c), on pages 20-22 of the application. In scenario (c) the home mobile network (HPLMN) is partially CAMEL-compliant and the visited mobile network (VPLMN) is either partially or fully CAMEL-compliant. The home and visited networks are set up so that mobile originated and mobile terminated calls for the roaming user trigger a CAP query to the gsmSCF variable (p. 19, lines 22-24). During the registration process (Fig. 5), the HPLMN sends a user profile to the VPLMN according to standard GSM procedure, with a gsmSCF address set to the address of the home intelligent gateway (p. 21, lines 1-2). Thus the visited network establishes messaging directly with the home intelligent gateway prior to connecting mobile originated calls for the roaming prepaid user.

New claims 18-19 are directed at the registration process within the home network, when the home mobile network is notified by the visited mobile network that the prepaid user is currently roaming. During the registration process the home intelligent gateway modifies records pertaining to the roaming prepaid user within the home network, so that call management messages for the roaming prepaid user are forwarded to the home intelligent gateway when calls are being placed for the roaming user.

Applicant respectfully submits that new claims 17-19 are fully supported in the specification.

In view of the above amendments and remarks it is respectfully submitted that independent claims 1, 5-7, and 9, and all claims which directly or indirectly depend therefrom are now in condition for allowance. It is further submitted that all matters raised by the Examiner have been attended to, and that the amendments do not add new matter to the application. Applicant asserts that new claims 11-20 are allowable for the reasons already argued. Prompt notice of allowance is respectfully and earnestly solicited.

Respectfully submitted,



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Date: February 2, 2004

Encl.

One month's extension fee